

glass

Libbey·Owens·Ford Glass Company

data for the architect



The **LIBBEY-OWENS-FORD GLASS COMPANY** is one of the world's largest manufacturers of flat glass. The main office is in Toledo, Ohio, and sales offices are maintained in principal cities as listed on Page 24 of this catalog. Nine factories with a combined floor area of 5,500,000 square feet are located in Rossford and East Toledo, Ohio, Ottawa, Ill., Shreveport, La., and Charleston and Parkersburg, W. Va.

Glass manufactured today has characteristics and qualities which the product did not possess a few years ago. Architects, designers, construction engineers and builders will find it helpful to consult Libbey-Owens-Ford on any question pertaining to the design and installation of the many types of window, plate and structural glass made at our factories. The company maintains in Toledo an up-to-date research department, technical laboratory and department of design.

All Libbey-Owens-Ford products for building purposes are sold and installed by authorized glass distributors and/or dealers.

THE GLASS PRODUCTS manufactured and marketed by Libbey-Owens-Ford are reviewed according to the index below.

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L-O-F <i>Tuf-flex</i> * Glass Doors—Ask for catalog No. TF-1 or see it in Sweet's File for Architects, 15b/1.	

THE FOLLOWING KINDS of glass manufactured by the Blue Ridge Glass Corp., Kingsport, Tenn., are sold by Libbey-Owens-Ford Glass Company through leading glass distributors throughout the United States.

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Light transmission values of Libbey-Owens-Ford glass

	Ultra Violet	Illuminant C Average Daylight	Total Radiation	Illuminant C Per Cent Transmission
D. S. A. Window Glass	74.8	90.0	85.5	
1/8" Plate Glass	76.7	90.0	85.1	3/8" Plate Glass 89.8
1/4" Plate Glass	71.9	88.9	81.5	1/2" Plate Glass 88.5
3/8" Plate Glass	69.5	88.3	79.4	5/8" Plate Glass 88.9
1/2" Standard Blue Plate Glass	78.6	58.6	75.7	3/4" Plate Glass 88.4
3/4" Medium Blue Plate Glass	78.5	45.9	70.4	7/8" Plate Glass 87.9
1" Dark Blue Plate Glass	78.1	5.0	49.2	1" Plate Glass 87.4
1 1/8" Peach Plate Glass	55.3	80.9	78.4	1 1/4" Plate Glass 86.4
1 1/4" Color Clear Plate Glass	85.4	91.6	91.3	
1 1/2" Color Clear Plate Glass	81.4	91.5	90.8	
1 3/4" Heat Absorbing Plate Glass	62.0	82.5	54.7	
1 7/8" Heat Absorbing Plate Glass	48.0	72.2	37.5	
2" Safety Plate Glass	69.4	89.0	81.0	

LIBBEY - OWENS - FORD GLASS COMPANY

A Great Name in GLASS!

description

A transparent glass made by grinding and polishing the two surfaces of a glass blank with the objective of making them flat and parallel and providing clear vision with minimum distortion.

qualities

Silvering and mirror glazing quality polished plate glass is used for the finest mirrors and for high quality glazing in residences.

Glazing quality polished plate glass is used for general glazing purposes.

uses

$\frac{1}{8}$ ", $\frac{1}{4}$ "—Small panes, leaded lights, railway coaches, mirrors, etc.

$\frac{1}{4}$ "—Windows of public and office buildings, residences and apartment buildings, storefronts, show cases, street cars, railway coaches, shelving, table and desk tops, large mirrors, etc.

$\frac{1}{2}$ "—Portlights, long shelves, glass furniture, back-ground for decoration, etc.

$\frac{1}{2}$ " to $1\frac{1}{4}$ "—Floor, deck and portlights on ships; aquarium tanks, glass furniture, table and desk tops, etc.

Color Clear* polished plate glass

Exceptionally clear and colorless, this L-O-F product does not detract from the true color of objects or merchandise behind it. Its quality is equivalent to that of regular polished plate glass.

Color Clear polished plate glass is ideal for Picture Windows, commercial refrigerator cases and mirrors.

Tuf-flex tempered Color Clear polished plate glass (page 11) is supplied in $\frac{1}{4}$ " thickness.

colored polished plate glass

Libbey-Owens-Ford produces polished plate glass in the following colors: standard blue, medium blue and peach. Coloring is uniformly controlled so these glasses can be used for such glazing purposes as Picture Windows. They are also highly recommended for mirrors and decorative applications. Colored polished plate glass is furnished in quality equivalent to that of regular polished plate glass.

Tuf-flex tempered colored polished plate glass (page 11) is $\frac{7}{32}$ " thick.

suggested specifications

Plate glass shall be Libbey-Owens-Ford polished plate glass and shall be of (.....) quality, and (.....) thickness in accordance with Federal Specification DD-G-451.

*®

edge finishing and special work

All types of flat glass may have their edges finished in various ways. The standard edge finishes are clean cut and swiped, clean cut and seamed, ground and seamed, flat ground, flat polished, bullnose polished, round polished, semi-round or pencil polished, mitered edges ground or polished, beveled edges ground or polished. Glass may be cut to size or to simple shapes with a glass cutter, and finished with abrasive belts and grinding and polishing wheels; holes may be drilled with hand or machine drills. Notches may be cut with a drill and glass cutter in combination. In cutting holes or notches, care should be taken not to exceed safe limits of glass. Notches are well to avoid where possible. Cut edges should be used only where edges are to be covered or protected by molding; abutting edges should be flat ground and exposed edges polished. Ground or polished, mitered or rounded grooves, depressions for hand holes, pen grooves, etc. may be wheel cut into surface of glass.

Polished plate glass can be bent to specification.

chart for specifying L-O-F polished plate glass

Type or Color	Thick-ness	Thick-ness Toler-ance	Standard Maximum Width and Length	Maximum Size Special Order	Approx. Weight Lbs. Per Sq. Ft.
Regular	$\frac{1}{8}$ "	$\pm \frac{1}{32}$ "	72" x 74"	74" x 144"	1.64
	$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	72" x 74"	74" x 144"	2.65
	$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	124" x 170"	124" x 250"	3.27
	$\frac{3}{8}$ "	$\pm \frac{1}{32}$ "	100" x 150"	120" x 200"	4.90
	$\frac{1}{2}$ "	$\pm \frac{1}{32}$ "	100" x 160"	100" x 200"	6.54
	$\frac{5}{8}$ "	$\pm \frac{1}{32}$ "	80" x 140"	100" x 160"	8.17
	$\frac{3}{4}$ "	$\pm \frac{1}{32}$ "	80" x 130"	100" x 150"	9.81
	$\frac{7}{8}$ "	$\pm \frac{1}{32}$ "	40" x 100"	50" x 100"	11.44
	1"	$\pm \frac{1}{32}$ "	40" x 100"	50" x 100"	13.08
	$1\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	40" x 100"	50" x 100"	16.25
Color Clear	$\frac{1}{8}$ "	$\pm \frac{1}{32}$ "	40" x 80"	55" x 90"	1.64
	$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	70" x 140"	90" x 140"	3.27
Colors: Standard Blue Medium Blue Peach	$\frac{7}{32}$ "	$\pm \frac{1}{32}$ "	100" x 140"	110" x 170"	2.86
	$\frac{1}{2}$ "	$\pm \frac{1}{32}$ "	100" x 140"	110" x 170"	2.86
	$\frac{3}{4}$ "	$\pm \frac{1}{32}$ "	100" x 140"	100" x 170"	2.86



Modern Visual Front of polished plate glass and Tuf-flex* tempered plate glass doors enables this ladies ready-to-wear store in Abilene, Texas, to display its merchandise day and night. Hughes and Olds, Architects.

L·O·F polished plate glass for mirrors

description

L-O-F Polished Plate Glass, because of its clearness and flatness and minimum of imperfections, is ideal for the manufacture of all types of quality mirrors.

Libbey-Owens-Ford Glass Company does *not* manufacture and sell chemically deposited mirrors for architectural purposes, but supplies polished plate glass to many of the leading mirror manufacturers.

uses

Mirrors are playing an increasingly important part in modern decoration and design. Architects and designers have found that mirrors bring increased light, beauty, sparkle and spaciousness into residences, hotels, apartment houses and public buildings.

A recent use of mirrors is to double the apparent size of a room or space by facing one wall or two adjoining walls with large mirror sections, attached with rosettes or mastic. For successful illusion the room must be designed as a half or a quarter of a room so that important features occur at the intersection of mirror-to-wall, mirror-to-ceiling or mirror-to-mirror.

Circular mirrors for dining rooms, fireplace-to-ceiling mirrors for living rooms, full length polished plate glass mirrors for bedrooms and dressing rooms, built-in mirrors for smart powder rooms—all aid in introducing charm and dignity into modern homes.

Commercial uses for mirrors are wide and varied—up-to-minute department stores and showrooms use large areas of mirrored surfaces for background effects, triple mirrors in clothing sections, overhead mirrors for decorative purposes. Mirrored walls and ceilings are used extensively in bars, restaurants, clubs, theaters, etc. and add decorative beauty and spaciousness where room is limited.

size limitations

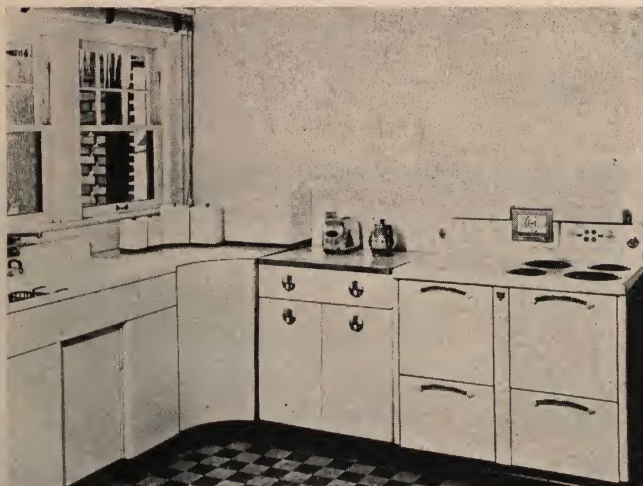
When facing wall areas with large mirror sections, it is generally advisable to keep the size of the sections within 6 x 12 feet, although larger dimensions can be furnished for special conditions. Larger wall areas may also be covered with a series of adjacent mirrors.

qualities

Mirrors are graded according to the quality of polished plate glass used. "A"—(Silvering Quality) used only for the finest mirrors. No. 1 (Mirror Glazing Quality) used for all types of selected mirrors. No. 2 (Glazing Quality) used for all other polished plate glass mirrors which are termed "commercial" mirrors.

These standards correspond to those established by the Department of Commerce through the National Bureau of Standards as Commercial Standard CS27-36.

Specify L-O-F Polished Plate Glass mirrors to insure the finest glass quality.



Before—This is a view of an ordinary kitchen in a home near Cleveland. A blank wall at the end facing the camera creates a definite line limiting the "size" of the room.



After—This is a view of the same kitchen after large polished plate mirrors had been installed. Note that the room seems to be much larger than in the view at the left.

description

Durability and permanence are outstanding qualities of L-O-F Transparent Mirrors—a new L-O-F product using evaporated chromium alloy for “One-Way Mirror” installations.

With a light transmission of approximately 8% and a light reflection from the mirrored side of about 50%, the specially treated polished plate glass when properly installed serves as a mirror from the front, but is transparent when viewed from the back. For example:

When an L-O-F Transparent Mirror is installed between two rooms one of which is brightly lighted and the other dimly lighted, an observer in the dark room can see into the lighted one, but the glass has the appearance of an opaque mirror in the illuminated room. The perfection of the performance is governed by the difference in brightness between the two rooms. The mirrored side should be installed toward the room into which a view is desired.

uses

The following suggested uses for L-O-F Transparent Mirrors are a few of many possible applications:

In residence entrance doors, hospital observation windows (particularly psychiatric), show windows, nursery doors in residences, instrument manufacturing (used in cameras and other scientific instruments), night clubs and taverns, security windows in government offices, banks, post offices, FBI offices, police departments, private offices, factories and institutions, and colleges and universities (psychology departments). The mirrors also are suitable for novel advertising signs and show windows.



A dining room in the Mayflower Hotel, Akron, Ohio, is a pleasant place. Twenty four L-O-F transparent mirrors at one side of the room offer brightness, a feeling of spaciousness and an opportunity for diners to view the floor show without turning.

durability

L-O-F Transparent Mirrors have been thoroughly tested in our laboratories and, wherever used, have been found to be satisfactory. Thousands were used in instruments during the war. They are highly resistant to the normal action of weathering, cleaning, handling and glazing compounds encountered in commercial glazing installations.

uniformity

L-O-F Transparent Mirrors are exceptionally uniform in quality. Such variation as may exist is not apparent to the normal eye in commercial installation.

A bare spot $\frac{3}{16}$ " x 1" at the top and bottom edges of all transparent mirror stock sheets will be found. This is inherent in the manufacturing process and should be concealed in the installation.

advantages

The new L-O-F Transparent Mirror, coated with evaporated chromium alloy, has many advantages over the chemically deposited transparent mirrors now on the market. Among its merits are permanence of coating and fidelity of color of objects viewed through the mirror.

sizes

L-O-F Transparent Mirrors are furnished in polished plate glass and in any size up to a maximum of 30" x 60".

Note: Other thicknesses of glass and other types of evaporated metal films will be considered upon application.



This is a photo of the same L-O-F transparent mirrors that are pictured at the left. Here, however, the floor show has been concluded and a flick of a switch has turned on lights behind the mirrors, making them a window which reveals a mural landscape.

description

Thermopane is the first successful, mass-produced, insulating unit of its kind for general use. It is a factory-built transparent glass unit composed of two or more lights of glass separated by $\frac{1}{4}$ " or $\frac{1}{2}$ " of dehydrated captive air, hermetically sealed around the edges at the factory with a metal-to-glass bond.

manufacture

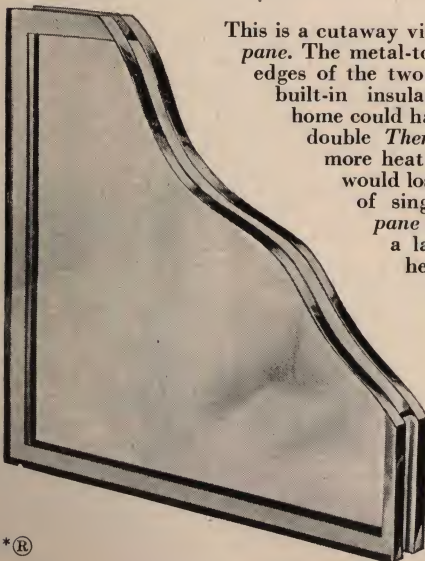
The glass is specially washed before the special Bondermatic Seal* is applied. The air hermetically sealed inside *Thermopane* units is scientifically cleaned and dried. L-O-F *Thermopane* can be furnished in squares or rectangles. Standard Sizes (pages 8 and 9) generally are used.

twelve features

Compared with single glass glazing, the important features of *Thermopane* are: Reduces heat loss through glass—saves fuel. . . . Reduces downdrafts at windows. . . . Is a metal-to-glass welded insulating unit. . . . Provides the benefits of storm sash without the bother. . . . Offers year-round double-glass protection. . . . Is suitable for all window openings. . . . Increases efficiency of air-conditioning equipment. . . . Reduces possibility of condensation. . . . Enables maintenance of uniform temperatures. . . . Reduces transmission of noise. . . . Provides day-by-day health and comfort benefits. . . . Is installed in a sash similarly to a single pane.

uses

Double-glass *Thermopane* is practical for glazing wood or metal windows and doors and window walls in homes, apartments, schools, hospitals and other structures requiring heating, air conditioning or noise reduction. Where higher humidities are encountered, triple-glass *Thermopane* is recommended.



This is a cutaway view of double *Thermopane*. The metal-to-glass bond seals the edges of the two panes of glass. This built-in insulation means that a home could have 115 square feet of double *Thermopane* and lose no more heat than a similar home would lose with 65 square feet of single glazing. *Thermopane* permits the influx of a large amount of solar heat without a prohibitive compensating loss. By combining various types of heat-absorbing, patterned glass and clear glass, the amount of light transmission may be controlled, if this is desirable.



This attractive *Thermopane* Picture Window brings cheer into this suburban home near New Philadelphia, Ohio.

heat loss transmission

Thermopane units provide a high resistance to heat flow, varying with the number of panes and the thickness of the air space. In summer *Thermopane*'s low heat transmission coefficient reduces the load on air conditioning systems. In winter it saves heat. The greater efficiency of *Thermopane* compared with single glazing makes it possible to use larger windows and keep the cost of fuel constant.

Because *Thermopane* is an insulating unit, it reduces the coefficient of heat transfer. This increases the temperature of the *Thermopane* surface facing the room side, thereby reducing "windowpane chills" and making living conditions more healthful and comfortable.

The insulating factor allows much more latitude in room design. Because the glass areas in single glazings cause a "cold spot" in the room, radiators or warm air grills are usually located near or under windows. With the warmer window temperature when *Thermopane* is used, there is more flexibility in planning heating outlets.

heat transmission table

The over-all heat transmission coefficient U varies with the ranges of temperature at which the coefficient is determined. For most practical heat loss calculations, coefficient U can be the value determined at ten degrees outside temperature, 70 degrees inside temperature, 15 mph outside air velocity, 0.25 mph average inside air velocity. The following table gives such values from actual tests with glass sizes 30" x 30":

Number of Panes	Glass Thickness	U Value		
		Air Space		
		None	$\frac{1}{4}$ "	$\frac{1}{2}$ "
Single Glass	$\frac{1}{8}$ "	1.16		
	$\frac{1}{4}$ "	1.15		
Double <i>Thermopane</i> (one air space)	$\frac{1}{8}$ " or $\frac{1}{4}$ "		.65	.58
Triple <i>Thermopane</i> (two air spaces)	$\frac{1}{4}$ "		.47	

*®

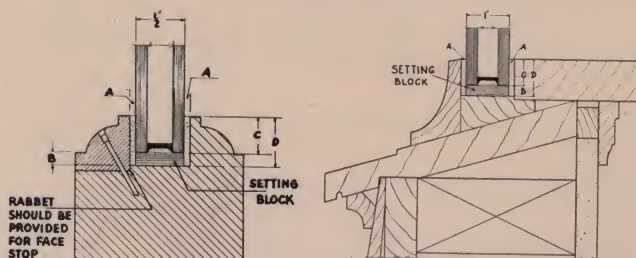
the windowpane that insulates



7a
2

glazing details

It is extremely important to remember that *Thermopane* is a factory-fabricated unit and, once made to specifications, its dimensions cannot be changed at point of use. Proper glazing clearances must be allowed on all *Thermopane* units, as well as sufficient rabbet depth, so that the metal seal does not show. The drawings and chart below give this information.



Symbol and Explanation	Glass Thickness					
	D. S. A. 1/8" Plate 1/8" Pat- terned	1/8" Sheet Glass		1/4" Plate 3/32" or 1/4" Patterned		
Glass Sizes	under 80 united inches	under 80 united inches	from 80-120 united inches	under 80 united inches	over 80 united inches	over 120 united inches
A—Glazing compound Bed—Width	1/8" - 1/8"	1/8" - 1/8"	1/8" - 1/8"	1/8"	1/8"	1/8"
B—Glazing Clearance (all edges)	1/8"	1/8"	3/16"	1/8"	3/16"	1/4"
C—Metalized Edge—Depth	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"
D—Total Rabbet Depth B+C	1/2"*	1/2"*	5/8"*	1/2"*	11/16"*	5/8"*

*Allowance made for dimensional tolerance.

glazing instructions

The following instructions must be observed for the successful installation of *Thermopane*:—

1. Check sash openings for squareness and full unit edge clearance.
2. Use a good, knife-grade, non-hardening glazing compound, free from corrosive materials.
3. Have glazing compound soft, and completely bed the back stop with it before inserting unit.
4. Press *Thermopane* in evenly. Do not force so as to twist the unit.
5. Do not nip corners. This breaks the seal.
6. Allow equal clearance on all edges between glass and sash.
7. Point up all edge voids between glass and sash.
8. Face all edges with glazing compound.
9. If wood stops or metal angles are used, do not exert undue pressure so that glazing compound is squeezed out, or unit is under strain at nail or screw points.
10. *Thermopane* must have a sufficient bed of glazing compound so that neither wood nor metal comes in contact with the glass at any point.*
11. Lights over 80 united inches must be supported on soft surface setting blocks. (Soft rot-proof wood, soft lead, or steel or aluminum blocks with soft lead tops). The width of the setting block must be the same as the thickness of the *Thermopane* unit.
12. Setting blocks should be located in from each corner and centered a distance of 1/4 the length of the light.
13. *Thermopane* units constructed with one light of Heat Absorbing Plate or Blue Ridge Aklo must be glazed with the Heat Absorbing Glass to the outside.
14. These glazing instructions are packed with each *Thermopane* shipment and our warranty does not apply unless they are followed.

*Exception: Approved metal storefront construction.

how to install *Thermopane*, step-by-step



1. Be sure opening is square so that unit will not bind. Bed back stop with a good, knife-grade, non-hardening glazing compound free of corrosive agents before inserting *Thermopane*.



2. Place unit on approved setting blocks located in from each corner and centered 1/4 the length of the unit. Press in evenly. Allow equal clearance between edges of the glass and sash.



3. Fill the voids on all edges with non-hardening glazing compound to prevent infiltration of air and water leakage. Do not use blocks of any kind at sides or top of *Thermopane*.



4. Cover perimeter with non-hardening glazing compound before applying the face stops. To avoid poor pressure, do not toenail unless the sash is rabbeted to receive them.

L·O·F Thermopane (continued)

double Thermopane standard sizes

Standard sizes for double *Thermopane* were developed by Libbey-Owens-Ford in cooperation with leading manufacturers of wood and steel sash in answer to requests from many architects and designers. There are numerous advantages to specifying standard *Thermopane* sizes. Manufacturers of wood sash have developed standard Picture Window frames and sash units using them. Glass distributors and wholesale sash and door jobbers carry warehouse stocks of these units, thus making *Thermopane* readily available. Architects can incorporate standard sizes in their specifications. Replacements and duplications of orders will be handled more quickly.

Standard *Thermopane* units are being manufactured in a wide range of sizes, readily adaptable by architects for new construction and remodeling.

All *Thermopane* units can be installed horizontally or vertically.

window walls and picture windows

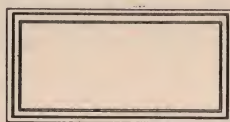
Thermopane is ideally suited for wall sections where complete visibility is desired such as in solar houses and daylight engineered buildings. Modern design emphasis has created an opportunity for architects to specify window wall construction using *Thermopane* in standard sizes.

Many sizes of *Thermopane* are used as Picture Windows. The nine sizes listed below generally are used in window walls.

Window Wall



Picture Window



Width	Height
42"	x 66"
56½"	x 66"
42"	x 72"
64½"	x 66"
84"	x 66"
84"	x 72"
72½"	x 66"
96"	x 66"
96"	x 72"

standard wood picture window units with flanking double hung windows

Picture Window Sash Opening (Without double hung unit)	Width	Height
4'-4" x 4'-2"		
5'-0" x 4'-2"		
6'-4" x 4'-2"		
4'-4" x 4'-6"		
5'-0" x 4'-6"		
5'-8" x 4'-6"		
6'-4" x 4'-6"		
7'-0" x 4'-6"		
8'-4" x 4'-6"		
5'-8" x 5'-2"		
6'-4" x 5'-2"		
7'-0" x 5'-2"		
8'-4" x 5'-2"		
10'-0" x 5'-2"		
5'-0" x 5'-10"		
5'-8" x 5'-10"		
6'-4" x 5'-10"		



Note: Standard double *Thermopane* units for above are composed of two ¼" panes of polished plate glass with ½" air space.

Picture Window Glass Size	Width	Height
48½" x 46"		
56½" x 46½"		
72½" x 46"		
48½" x 50"		
56½" x 50"		
64½" x 50"		
72½" x 50"		
80½" x 50"		
96½" x 50"		
64½" x 58"		
72½" x 58"		
80½" x 58"		
96½" x 58"		
116½" x 58"		
56½" x 66"		
64½" x 66"		
72½" x 66"		

Note: Window openings will vary according to individual sash manufacturer's specifications. Therefore, manufacturers should be contacted for full information regarding their units.

standard wood picture window units with flanking casements

Window Opening (Including the Casement Units)	Width	Height
6'-5 ¼" x 3'-2 ½"		
6'-5 ¼" x 4'-2 ½"		
8'-1" x 4'-2 ½"		
9'-8 ¾" x 4'-2 ½"		
6'-5 ¼" x 5'-2 ½"		
8'-1" x 5'-2 ½"		
9'-8 ¾" x 5'-2 ½"		



Note: Standard double *Thermopane* units for above are composed of two ¼" panes of polished plate glass with ½" air space.

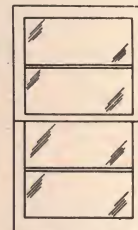
Picture Window Glass Size	Width	Height
35½" x 36"		
35½" x 48½"		
55½" x 48½"		
75" x 48½"		
35½" x 60½"		
55½" x 60½"		
75" x 60½"		

double hung windows



Wood sash manufacturers offer check rail double hung windows, in both two-light and four-light horizontal sash as illustrated.

The complete range of standard sizes for double *Thermopane* double hung units is shown in the table below.



Window Opening	Glass Sizes	
Width Height	2-Light	4-Light
2'-0" x 4'-2"	20" x 22"	20" x 10½"
2'-4" x 4'-2"	24" x 22"	24" x 10½"
2'-4" x 4'-6"	24" x 24"	24" x 11½"
2'-8" x 4'-6"	28" x 24"	28" x 11½"
3'-0" x 4'-6"	32" x 24"	32" x 11½"
3'-4" x 4'-6"	36" x 24"	36" x 11½"
3'-8" x 4'-6"	40" x 24"	40" x 11½"
4'-0" x 4'-6"	44" x 24"	44" x 11½"
2'-4" x 5'-2"	24" x 28"	24" x 13½"
2'-8" x 5'-2"	28" x 28"	28" x 13½"
3'-0" x 5'-2"	32" x 28"	32" x 13½"
3'-4" x 5'-2"	36" x 28"	36" x 13½"
3'-8" x 5'-2"	40" x 28"	40" x 13½"
4'-0" x 5'-2"	44" x 28"	44" x 13½"

Double *Thermopane*, manufactured with two lights of Double Strength "A" quality L·O·F Window Glass or ⅛" Polished Plate, with ¼" air space, is standard for double hung windows.

aluminum picture window units with flanking double hung windows

Aluminum sash manufacturers have developed units which will use *Thermopane* standard sizes either for separate Picture Windows or for Picture Windows with flanking double hung aluminum sash. One manufacturer of aluminum sash has developed a standard Picture Window unit which can be used as a single sash or with flanking double hung stock windows. For the latter, the following standard glass sizes have been adopted:

Picture Window Sash Opening	Width	Height
4'-0" x 4'-8"		
5'-0" x 4'-8"		
6'-0" x 4'-8"		
4'-0" x 5'-0"		
5'-0" x 5'-0"		
6'-0" x 5'-0"		



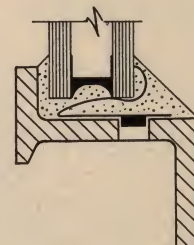
Note: Standard double *Thermopane* units for above are composed of two ¼" panes of polished plate glass with ½" air space.

Picture Window Glass Size	Width	Height
46½" x 52½"		
58½" x 52½"		
70½" x 52½"		
46½" x 56½"		
58½" x 56½"		
70½" x 56½"		

standard steel sash standard sizes

Double *Thermopane*, manufactured with two lights of Double Strength "A" quality L-O-F Window Glass or $\frac{1}{8}$ inch L-O-F Polished Plate Glass, both with $\frac{1}{4}$ inch air space, is standard for many residential steel casement windows. For satisfactory glazing of *Thermopane*

in steel sash, special clips (see illustration) have been developed by Libbey-Owens-Ford. For detailed information, contact the nearest Libbey-Owens-Ford district office.



standard specifications

All insulating glass shall be *Thermopane* of sizes indicated on the drawings and composed of (two) (three) (.....) panes of glass..... thick, hermetically sealed with a metal-to-glass bond

and separated by a ($\frac{1}{4}$ " or ($\frac{1}{2}$ ") dehydrated air space, as manufactured by Libbey-Owens-Ford Glass Company, Toledo, Ohio, and installed according to manufacturer's instructions.

double Thermopane types of glass and sizes

Type of Glass	Min. Size $\frac{1}{4}$ " or $\frac{1}{2}$ " Air Space	Maximum Size With $\frac{1}{4}$ " Air Space	Maximum Size With $\frac{1}{2}$ " Air Space	Thickness Range		Dimensional Tolerance	Approx. Aver. Net Weight per Sq. Ft.
				$\frac{1}{4}$ " Air Space	$\frac{1}{2}$ " Air Space		
D.S.A. $\frac{1}{8}$ " Blue Ridge Patterned $\frac{1}{8}$ " Blue Ridge Aklo (Max. width 28") $\frac{1}{8}$ " Polished Plate $\frac{1}{8}$ " Heat Absorbing Plate	8" x 8"	32" Max. Width 76" Max. Length Length not to exceed 4 $\frac{1}{2}$ times width Total Area 1400 sq. in.	24" Max. Width 76" Max. Length Length not to exceed 4 $\frac{1}{2}$ times width Total Area 1400 sq. in.	$\frac{7}{16}$ " to $\frac{9}{16}$ "	$\frac{11}{16}$ " to $\frac{13}{16}$ "	8" to 32" wide to 48" long $\pm \frac{1}{16}$ " 48" to 76" long $+\frac{1}{8}$ " $-\frac{1}{16}$ "	3 $\frac{1}{2}$ lbs.
$\frac{3}{16}$ " Sheet	8" x 8"	42" Max. Width 72" Max. Length	42" Max. Width 72" Max. Length	$\frac{9}{16}$ " to $\frac{11}{16}$ "	$\frac{13}{16}$ " to $\frac{15}{16}$ "		5 lbs.
$\frac{1}{4}$ " Polished Plate	8" x 8"	48" Max. Width 132" Max. Length Total Area 4800 sq. in.	98" Max. Width 132" Max. Length Total Area 9600 sq. in.	$\frac{11}{16}$ " to $\frac{13}{16}$ "	$\frac{15}{16}$ " to $1\frac{1}{16}$ "	8" to 36" wide $+\frac{1}{8}$ " $-\frac{1}{16}$ "	7 lbs.
$\frac{1}{4}$ " Heat Absorbing Plate	8" x 8"	48" Max. Width 100" Max. Length Total Area 3600 sq. in.	60" Max. Width 100" Max. Length Total Area 3600 sq. in.			36" to 98" wide $+\frac{3}{16}$ " $-\frac{1}{16}$ "	6 $\frac{1}{4}$ lbs.
$\frac{7}{32}$ " Blue Ridge Patterned $\frac{1}{4}$ " Blue Ridge Aklo (Max. width 28")	8" x 8"	48" Max. Width 100" Max. Length Total Area 4800 sq. in.	48" Max. Width 100" Max. Length Total Area 4800 sq. in.	$\frac{5}{8}$ " to $\frac{3}{4}$ "	$\frac{7}{8}$ " to 1"		
Tuf-flex ($\frac{1}{4}$ ") Polished Plate and Heat Absorbing Plate	8" x 8"	40" x 48"	40" x 48"	$\frac{11}{16}$ " to $\frac{13}{16}$ "	$\frac{15}{16}$ " to $1\frac{1}{16}$ "		7 lbs.

For building exteriors, sizes 48" wide or over will be manufactured with $\frac{1}{2}$ " air space only.

For Don Graf's Technical Sheets on *Thermopane* and *Thermopane* Installation Details for Wood Sash, write to your nearest L-O-F District Office.

THERMOPANE WARRANTY

For a period of five (5) years from date of shipment from our factory, we warrant that under normal conditions, material obstruction of vision resulting from film formation, or dust collection between the interior glass surfaces of *Thermopane*, will not occur.

This warranty will be void unless *Thermopane* is installed in accordance with our installation instructions, or if any cutting, fitting, or nipping of edges or corners, is done, accidentally or

otherwise, after shipment from our factory, or if the unit is damaged in handling, installation or otherwise.

Our maximum liability under this warranty shall be the delivery of replacement lights of *Thermopane* to the railroad shipping point nearest the place of installation.

This warranty does not apply when *Thermopane* is used in railroad cars or other vehicles, nor outside continental United States.

Libbey-Owens-Ford Glass Company

description

L-O-F Flat Drawn Sheet Glass—representing the result of more than 30 years of quality glass manufacturing—is exceptionally transparent and has a natural fire-finished surface. It is relatively free of distortion. L-O-F uses its own Flat Drawn Process in manufacturing sheet glass. The result is a better annealed window glass that is less subject to breakage.

classification

Libbey-Owens-Ford Sheet Glass is classified on the basis of thickness as Window, Heavy Sheet and Picture Glass.

Window Glass is supplied in two thicknesses:

1. Single Strength, varying from 10 to 11.8 lights per inch and identified by a *red* label.
2. Double Strength, varying from 7.5 to 8.7 lights per inch, and identified by a *blue* label.

Window Glass is supplied in four standard qualities:
 "AA"—Specially selected glass for high grade work.
 "A"—Select glass of superior glazing quality.
 "B"—Suitable for general glazing purposes.

Greenhouse—Glass of special quality available in double strength only in sizes 16" x 18", 16" x 24" and 18" x 20".

Heavy Sheet Glass is supplied in thicknesses of $\frac{3}{16}$ " and $\frac{7}{32}$ ", and in qualities "AA", "A", and "B".

Picture Glass is furnished in three standard thicknesses listed in the chart to the right, and in "AA", "A", and "B" qualities.

uses

Libbey-Owens-Ford Sheet Glass for glazing windows, doors and storm sash in homes, apartments and other types of buildings; cabinet fronts and shelving.



Where quality window glass is desired, specify Libbey-Owens-Ford as did Architect Victor Hornbein of Denver.

Libbey-Owens-Ford Heavy Sheet Glass for glazing windows and doors where greater strength is required but where slight distortion is not objectionable; shelving; display cases; window ventilators and furniture tops.

Libbey-Owens-Ford Picture Glass for covering pictures, photographs, maps and prints; lantern slides; novelties and instrument dials.

suggested specifications

All sheet glass shall be Libbey-Owens-Ford Flat Drawn ("A") Quality (Double Strength). Each light shall bear the identifying L-O-F label.

packing

Shipped in soundly-constructed boxes, Libbey-Owens-Ford Sheet Glass is given neat, clean and practically moisture-proof protection.

chart for specifying

Classification	Quality	Thickness in Inches	Approximate Wt. Sq. Ft. in Ozs.	Maximum Size Furnished
Window Glass				
Single Strength	"AA", "A", "B"	.085-.100	19.50	90 united in.
Double Strength	"AA", "A", "B"	.115-.133	26	120 united in.
Greenhouse		.115-.133	26	16" x 18" 16" x 24" 18" x 20"
$\frac{3}{16}$ " Heavy Sheet	"AA", "A", "B"	.182-.205	40	50 sq. ft.
$\frac{7}{32}$ " Heavy Sheet	"AA", "A", "B"	.205-.230	45	60 sq. ft.
Picture Glass				
19-23 lts. per in.	"AA", "A", "B"	.043-.053	9 to 11	60 united in.
Picture Glass				
15-17 lts. per in.	"AA", "A", "B"	.058-.068	12 to 14	60 united in.
Picture Glass				
12-14 lts. per in.	"AA", "A", "B"	.070-.080	15 to 17	60 united in.



Libbey-Owens-Ford window glass was specified for this apartment hotel near Chicago. Holabird and Root, Architects.

description

Tuf-flex is tempered polished plate glass made by a process of reheating and sudden cooling, as a result of which the outer surfaces are in a state of high compression while the central portion remains in tension, producing a condition highly resistant to breakage. The *Tuf-flex* process can be applied to both clear and colored polished plate glass.

properties

Tuf-flex is approximately three to five times stronger than regular polished plate glass in sustaining loads and resisting fracture due to strain, and approximately five to seven times more resistant to ordinary impact and three times more resistant to thermal shock. It is more resistant to bending stresses than polished plate glass. A piece of $\frac{1}{4}$ " *Tuf-flex* 42" long and 12" wide can be twisted through an angle of 20° without breaking. *Tuf-flex* retains the same appearance, clearness, hardness and coefficient of expansion as regular polished plate glass. When its limit of resistance is reached, *Tuf-flex* does not break like ordinary glass into jagged pieces, but disintegrates into small crystals.

uses

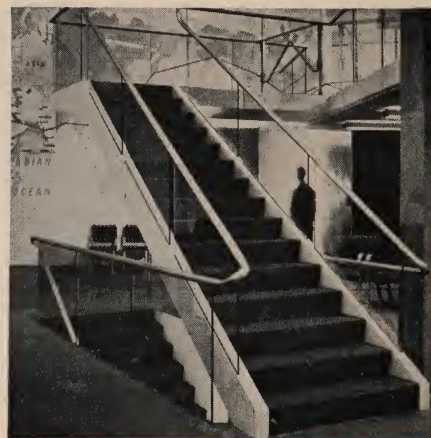
The greater strength of *Tuf-flex* has resulted in its wide use for visual entrance doors (specific data available in separate catalog No. TF-1 in Sweet's File for Architects, section 15b(1)), ship's glazing, steam and oil pressure gauge covers, shelving, furniture, counter tops, show cases, and for enclosures in museums, zoological gardens and aquariums. Its ability to withstand impact makes *Tuf-flex* especially adaptable for balustrades, stair railings, push and kick plates on doors, windows in gymnasiums and sports arenas, and in jails, hospitals and mental institutions. The high resistance of *Tuf-flex* to thermal shock renders it advantageous as lenses for searchlights, floodlights, and spotlights where the heat generated by high intensity lamps would shatter regular glass; for sterilizing ovens, and for peep hole glasses in furnaces and lehrs.

special conditions

Tuf-flex can be ordered in circles, squares, rectangles and special shapes cut to pattern. It can also be supplied in a variety of edge finishes. However, since it cannot be cut after it is tempered, the exact sizes required must be specified, and intricate designs should be submitted for approval.

* (R)

This handsome railing of *Tuf-flex* polished plate glass was installed at the new Chicago ticket office of the Trans-World Airline. Notice that it casts no shadow on the stairs. Architects: Skidmore, Owings and Merrill, Chicago.



guide for specifying L·O·F Tuf-flex tempered polished plate glass

Kind	Thickness	Min. Width	Max. Size	Thickness Tolerance	Dimensional Tolerance
Regular Polished Plate Glass	$\frac{1}{4}$ "	$\frac{3}{8}$ "	56" x 108"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
	$\frac{5}{16}$ "	$\frac{3}{8}$ "	40" x 100"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
	$\frac{3}{8}$ "	$\frac{3}{8}$ "	40" x 100"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
	$\frac{1}{2}$ "	$\frac{3}{8}$ "	56" x 108"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
Color Clear Polished Plate	$\frac{1}{4}$ "	2"	48" x 72"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
Colored Polished Plate	$\frac{1}{4}$ "	2"	48" x 72"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "
Heat Absorbing Polished Plate	$\frac{1}{4}$ "	2"	48" x 72"	$\pm \frac{1}{32}$ "	$\pm \frac{1}{16}$ "

Circles and squares are available.

comparative modulus of rupture

Polished Plate Glass	<i>Tuf-flex</i>
Average—6,000 lb./sq. in.	Average—30,000 lb./sq. in.

comparison of impact

Kind of Glass	2 Lb. Steel Ball Critical Height Dropped	11 Lb. Shot Bag Critical Height Dropped
$\frac{1}{4}$ " Polished Plate $\frac{1}{4}$ " <i>Tuf-flex</i>	Average 8 inches Average 60 inches	Average 37 inches Average 160 inches

resistance to thermal shock

Kind of Glass	Average difference in temperature F° required to cause failure
$\frac{1}{4}$ " Polished Plate $\frac{1}{4}$ " <i>Tuf-flex</i>	147° F 466° F

L-O-F heat absorbing polished plate glass

description

L-O-F Heat Absorbing Polished Plate Glass is a product of special chemical composition, pale bluish green in color, and made to absorb a high percentage of the infrared heat rays of the sun. Part of the absorbed heat is subsequently transferred to the interior, but a considerable portion is given off to the exterior, effecting a net reduction of the solar heat entering through the glass.

qualities

L-O-F Heat Absorbing Polished Plate Glass $\frac{1}{8}$ " thick excludes 25.1% of the total solar radiation; $\frac{1}{4}$ " thick 32.5% as compared with an exclusion of 14.4% afforded by regular plate glass $\frac{1}{4}$ " thick. These figures are based on the assumption of 50% of the reradiation of the absorbed heat in the glass to the interior and 50% to the exterior. This reduction of solar heat transmission will produce a cooler atmosphere inside, resulting in lower initial cost for the air conditioning equipment and reduced cost of operation. L-O-F Heat Absorbing Polished Plate Glass reduces sun glare, and provides light which is restful to the eyes and nerves.

uses

L-O-F Heat Absorbing Polished Plate Glass is particularly suited for glazing the windows of office and apartment buildings, hospitals, schools, factories, and other types of buildings where the exclusion of solar heat is a problem. Merchants whose wares are perishable will find Libbey-Owens-Ford Heat Absorbing Polished Plate Glass beneficial for show windows. Because of its

heat absorbing characteristics, this glass helps protect merchandise such as fruits, vegetables, candy, flowers, and other perishables, helps to keep it fresh much longer. It also is useful for windows of stores such as groceries, butcher shops, drug stores and ice cream parlors where refrigerating equipment may necessarily be in line with rays of the sun coming through show windows.

special processing

If desired, L-O-F Heat Absorbing Polished Plate Glass can be supplied in the form of *Tuf-flex* (see page 11). This makes it stronger than polished plate glass and more resistant to impact and thermal shock.

L-O-F Heat Absorbing Polished Plate Glass also can be incorporated as the outside light in *Thermopane* insulating units in sizes not over 25 square feet (see pages 6, 7, 8 and 9) in combination with regular polished plate glass on the inside. This will reduce the solar heat transmission to 90% as much as would occur through a single light of heat absorbing glass, or to 65 to 70% as much as would occur through *Thermopane* manufactured with two lights of clear glass.

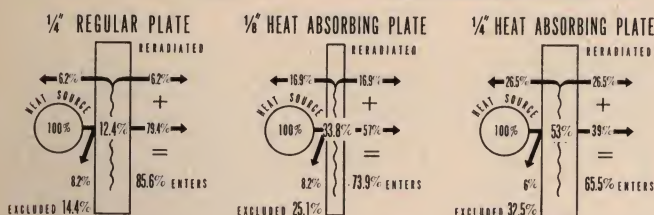
The *Thermopane* arrangement is recommended for year-round insulation, since it most effectively reduces heat loss through windows in winter and heat gain in summer.

suggested specifications

All heat absorbing plate glass shall be L-O-F Heat Absorbing Polished Plate Glass of (.....) thickness as manufactured by Libbey-Owens-Ford Glass Company, Toledo, Ohio.

guide for specifying

Thickness	Thickness Tolerance	Maximum Width and Length	Approx. Weight Lbs. per Sq. Ft.
$\frac{1}{8}$ "	$\pm \frac{1}{32}$ "	40 inches by 80 inches	1.64
$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	25 sq. ft. max. area-100" longest dimension	3.27



(NOTE: The percentage factors shown for solar heat exclusion are comparative only since all assume that the sun rays are normal (perpendicular) to glass and that the absorbed heat energy is reradiated equally on both sides of each glass. Such conditions practically never exist. Reradiation and convection are affected by temperatures inside and out, air flow speeds and many other factors. However, the figures are relative between diagrams and can be of assistance in selecting a glass combination by comparing one glass combination to another.)

Comparative Properties Libbey-Owens-Ford Heat Absorbing Polished Plate Glass and Regular Polished Plate Glass			
	Thickness	Per cent of Transmission	
		Average Daylight	Total Radiation
Regular L-O-F Polished Plate	$\frac{1}{4}$ "	88	80
L-O-F Heat Absorbing Polished Plate	$\frac{1}{8}$ "	83	57
L-O-F Heat Absorbing Polished Plate	$\frac{1}{4}$ "	74	39

decoration on Vitrolite, polished plate and Blue Ridge glass.

Decoration on glass has a wide range of possibilities, as suggested by the following processes:

surface sandblast—Uniform sandblasting over all or part of glass, in grades from very slight to complete removal of polished surface.

shaded sandblast—Gradations of shading ranging from natural surface to complete obscuration of polish.

deep sandblast—Decoration cut below surface of glass but without modeling or gradation.

carved sandblast—Cut to various depths below surface of glass for fine bas-relief or intaglio.

shaded and carved sandblast—May be combined in one decoration, achieving various tones with deeper cut accents.

painted (air drying)—Usually on back surface of glass; often used in connection with mirrors.

painted sandblast—Air drying decoration applied to sandblasted portions on face or back.

inlay—Thin glass, in variety of opaque or translucent colors, or silver-backed colored glass is inlaid into Vitrolite sandblasted to receive the inlay, or into 1/2" or thicker plate glass with sandblasted surface.

laminated—Letters or decoration, in silhouette, cut from Vitrolite or thin colored glass and cemented to Vitrolite or other glass background.

Decoration on glass is executed by expert craftsmen in our glass decorating department from architects' full size details or developed by L-O-F from architects' scale drawings.



Over altar decoration, six feet square, in the Shrine of the Ohio Memorial Forest, Loudenville, Ohio. Britsch and Munger, architects. This striking example of fine glass decoration makes use of 5/8" plate glass with a sandblasted surface into which pieces of thin, colored, opaque glass and colored mirrored glass are inlaid. The parts of the glass background which show through are finished on the back in silver and gold and other metallic colors.

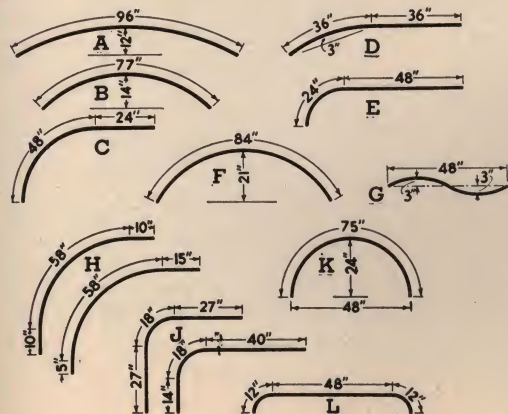
Note:—Processes such as fired-on ceramics on polished plate glass, leaded glass windows, acid etching, etc. may be secured through L-O-F dealers or jobbers.

L-O-F bent glass

Most bent glass shapes are produced by causing flat glass to form in a mould by the action of heat and gravity only. It is not a machined product, and is subject to more distortion and wider tolerances than flat polished plate or window glass.

explanation of diagrams

Dimensions on diagrams are to illustrate maximum limits of proportions. Radii of curves may not be less than 6". Radii should be specified to outside surface of



glass. Maximum rise of bends J and K must not exceed 36". Depth of G bends not to exceed 1 in 16; example, pane 64", depth 4". Flat portions of bent glass cannot be kept entirely flat where large flat areas are required. It is recommended that flat portions be ordered as separate lights. It is recommended that bent Vitrolite panels should not exceed 6 sq. ft. in area for exterior work. For Vitrolite or Blue Ridge Glass specify which face of glass is concave or convex. Requirements for bends in glass of greater thicknesses than listed below or for sizes in excess of the maximum dimensions listed should be submitted for consideration.

maximum sizes of bends (in inches)

Bends	Thickness	Polished Plate Glass			Color Clear Polished Plate		Heat Absorbing Polished Plate	
		1/8	1/4	3/4	1/8	1/4	1/8	1/4
A, B, C, D, E, F, L.	Distance Around Bend	60 or 48	70 or 68	110	40	70	60 or 30	96**
	Length	48 or 60	68 or 70	144	60	140	30 or 60	96**
	Colored Polished Plate	Sheet Glass			Blue Ridge Glass		Vitrolite	
H, J, K, G	Thickness	3/32	S.S.	D.S.	1/16	3/32	1/16	1/16
	Distance Around Bend	90	24	60 or 48	60	84	60 or 48	84 or 48
	Length	116	48	48 or 60	84	96	48 or 60	48 or 84
Same as in schedule above except that distance around bend may not exceed 78".								
Same as in schedule above except that maximum distance around bend may not exceed 48" and maximum length may not exceed 72".								

** 25 Sq. Ft. maximum area

BLUE RIDGE patterned and wire glass

Blue Ridge glass embraces a complete range of scientifically designed Patterned and Wire glass, for which Libbey-Owens-Ford is the United States' Sales Agent.

description

Blue Ridge Patterned Glass, which includes more than 20 individual patterns is a flat-rolled, translucent glass in which a distinctive light-controlling geometric or linear design is impressed into one or both surfaces during manufacture. All are semi-transparent, and provide diffused light transmission. Most Blue Ridge patterns can be obtained in Wire Glass for greater resistance to fire hazards.

There are four types of finish available in Blue Ridge Patterned and Wire Glass. These are:

1. *Plain Rolled Fire-Polished*—surfaces as they come from the lehr without further treatment.
2. *Satinol finish*—a treatment of one or both sides which imparts a soft, satin-like finish, increasing obscurity and spreading transmitted light uniformly over a wide area. Does not finger mark or collect dust and dirt—is easily cleaned with a dry or damp cloth. Available in all patterns. On one surface, Satinol reduces light transmission about 3%... both surfaces about 6%.
3. *Frosted finish*—acid-etching of both glass surfaces to improve distribution of transmitted light.
4. *Sandblasted finish*—to increase obscurity and diffusion of transmitted light. Spreads the light in a circular pattern. Sandblasting on one side reduces light transmission about 16% and, on both sides, from 20 to 30%.

uses

Blue Ridge Patterned Glass is desirable, wherever glazing requirements include high light transmission or diffusion, privacy, and distinctive decoration. Applications include windows, doors, partitions of all kinds, transoms, skylights, decorative panels, cupboard doors, shelving backgrounds, displays, signs and lighting fixtures. (Note: For glare-and-heat reduction, see Blue Ridge Aklo glass, pages 20 and 21).

"securit process"

Practically all Blue Ridge Patterns may be *Securitized*—(heat-tempered)—to increase resistance, to thermal and physical shock. *Securitized* Patterned Glass is safer for, if broken, it disintegrates into small diced particles. (Note—Wire Glass cannot be Securitized).

suggested specifications

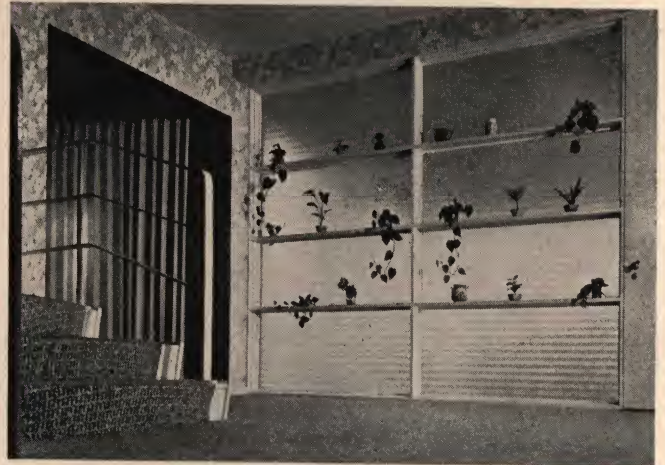
Where Patterned or Polished Wire or Obscure glass is specified herein, or shown on plans, it shall be () inches in thickness and shall be () pattern (specify thickness and pattern desired), and shall be manufactured by the Blue Ridge Glass Corporation.

If a surface finish other than plain rolled is desired, the type of surface finish, such as Satinol or Frosted, should be specified.

The Standard Satinol or Frosted (Glare Reducing) Finish Specification is: "Where Patterned or Obscure glass is specified herein or shown on plans, it shall be () inches in thickness and shall be () pattern Satinol (one surface or two surfaces), or have Frosted (Glare Reducing) finish on both surfaces, and each light shall bear the label of Blue Ridge Glass Corporation."



Clear Flutex flanks the entrance to Kroehler Display Rooms, Chicago... adds the sparkle that attracts customers. Architect: Sterling McDonald.



Satinol Louvrex screens porch, admits daylight to hall and forms a distinctive backdrop for plants. Architect: James E. Eppenstein, Chicago.



Light plus privacy gained through panels of clear Doublex which top the partitions in the buying offices of Lester Martin and Company, New York.



Interesting use of bent and flat *Satinol* Louvrex to diffuse light in Moniteau Mills offices, New York. Designed by Robert Gruen Associates.



Clear Doublex stair-guard railing directs customers' attention to balcony at Wolf & Dessauer, Ft. Wayne, Ind. Architect A. M. Straus.



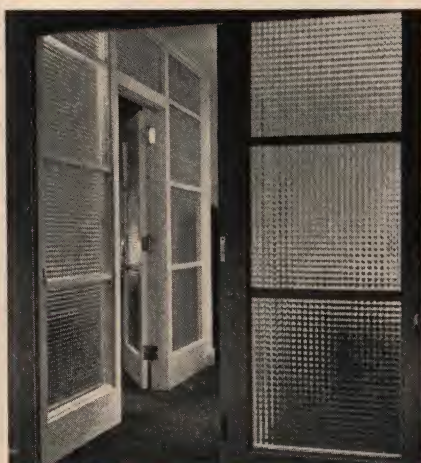
Panel of Flutex lets light filter from dinette to kitchen, yet conceals work area. Architect C. W. Mayhew, San Francisco.



Clear Louvrex hides an unpleasant view, admits ample light. Grenadier Dining Room, Detroit Leland Hotel.



Bent Flutex shields the serving counter. And it's so easy to clean! William C. Stimson Restaurant, Erie, Pa.



Doublex doors and walls admit light to executive offices. Hotel Statler, Cleveland, Ohio.



In line with modern design! Flutex screen separates office from lobby. Architect: Ernst Payer, Cleveland.



Privacy plus light through Doublex Partitions! Hegarty-Hyland Buying Offices designed by Alyne Whalen, Beverly Hills.

five leading BLUE RIDGE patterns

these smart patterns
enable

*Architects
and
Designers*

to create
pleasing and
desirable interiors
and exteriors



Stylex

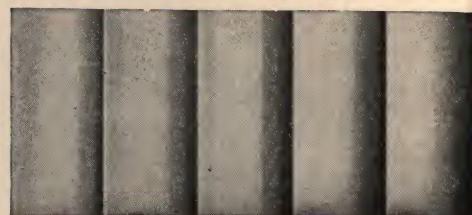
(Cross section shown, actual size)

A rolled flat glass, with one smooth side and one pattern side consisting of curved parallel concave waves about $\frac{3}{4}$ " deep. The crest of the waves are about $\frac{3}{4}$ " apart, the surface of each being striated with approximately 15 small equidistant ribs about $\frac{1}{1000}$ " deep and parallel to the crests.

Made in $\frac{1}{8}$ " and $\frac{7}{32}$ " thicknesses with fire-polished, ground and polished and Satinol finishes.

Approximate Light Transmission—unwired 73% (not made in wire glass).

USES—Decorative interior installations for partitions, wall panels, kitchen cupboard doors.



Linex

(Cross section shown, actual size)

A rolled flat glass, one surface being smooth and the pattern side consisting of curved parallel concave flutes measuring about $\frac{3}{4}$ " deep. The crests of the flutes are approximately $\frac{1}{2}$ " apart.

Linex is made in $\frac{1}{8}$ " and $\frac{7}{32}$ " thicknesses in fire-polished, ground and polished and Satinol finishes.

Approximate Light Transmission—unwired 80% (not made in wire glass).

USES—Decorative interior and exterior glazing.



Louvrex

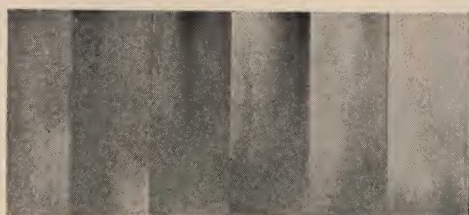
(Cross section shown, actual size)

1 in. wide, alternately ascending and descending, plane-surfaced strips, resembling louvers in venetian blinds. Quite transparent, but Satinol finish increases obscurity and diffusion.

Made $\frac{1}{8}$ " and $\frac{7}{32}$ " thick with fire-finished surfaces and $\frac{7}{32}$ " thick only with flat surface mechanically ground and polished; also with flat surface Satinol processed.

Approximate Light Transmission—unwired 90.4% (not made in wire glass).

USES—Interior and exterior glazing, partitions, transoms etc.



Flutex

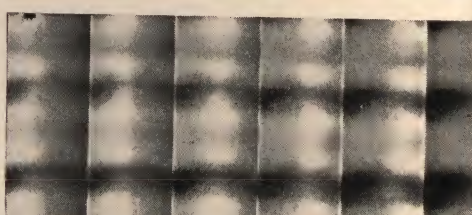
(Cross section shown, actual size)

Pattern consists of adjoining convex flutes 1 in. wide.

Made in $\frac{1}{8}$ " and $\frac{7}{32}$ " thicknesses with fire-polished surfaces, and in $\frac{7}{32}$ " thickness only with flat surface mechanically ground and polished; also with flat surface Satinol processed.

Approximate Light Transmission—unwired 89% (not made in wire glass).

USES—Same as those of Louvrex. Provides effect of sharper, more definite pattern. (Note: Satinol Flutex, $\frac{7}{32}$ " thick, is widely used in fluorescent light fixtures).



Doublex

(Cross section shown, actual size. Broken line indicates right angle corrugation on back)

A double patterned glass whose corrugated design on one surface runs at right angles to fluted design on other surface, forming a pronounced directional effect.

Made in $\frac{7}{32}$ " thickness, with maximum width of 54" and length of 136".

Approximate Light Transmission—87%.

USES—Interior and exterior glazing, partitions, screens, illuminated wall panels and other decorative purposes.

specifications for five leading Blue Ridge glass patterns

Product	Uses	Light Diffusion and Obscurity	Pattern	Thick-ness	Plain Rolled, Fire Finish Max.*Width and Length	Surface			Approx. Weight Sq. Ft. Lbs. Glass Only
						Ground and Polished flat surface	Frosted Max. Width and Length	Satinol Max. Width and Length	
Louvrex	Decorative Interior and Exterior use	Slight	Alternate 1" angular planes	$\frac{1}{8}$ "	54" x 132"			54" x 132"	1 $\frac{3}{4}$ lbs.
Flutex	Decorative Interior and Exterior use	Slight	Adjoining 1" convex flutes	$\frac{7}{32}$ "	54" x 136"	54" x 136"		54" x 136"	2 $\frac{3}{4}$ lbs.
				$\frac{1}{4}$ "	54" x 132"			54" x 132"	1 $\frac{3}{4}$ lbs.
Doublex	Decorative Interior and Exterior use	Good	1" Block pattern	$\frac{7}{32}$ "	54" x 136"	54" x 136"		54" x 136"	2 $\frac{3}{4}$ lbs.
				$\frac{1}{8}$ "	54" x 136"			54" x 136"	2 $\frac{3}{4}$ lbs.
Stylex	Decorative Interior use	Medium (Directional Spread)	Fine ribs on flute	$\frac{1}{8}$ "	48" x 132"		48" x 132"	48" x 132"	1 $\frac{3}{4}$ lbs.
				$\frac{7}{32}$ "	48" x 136"	48" x 136"	48" x 136"	48" x 136"	2 $\frac{3}{4}$ lbs.
Linex	Decorative Interior and Exterior use	Slight	$\frac{1}{2}$ " Concave flutes	$\frac{1}{8}$ "	48" x 132"		48" x 132"	48" x 132"	1 $\frac{3}{4}$ lbs.
				$\frac{7}{32}$ "	48" x 136"	48" x 136"	48" x 136"	48" x 136"	2 $\frac{3}{4}$ lbs.

*In some patterns, widths are available up to 60 inches, depending upon stocks on hand, but glass wider than 48 inches cannot be Frosted.

description

A continuous process wire glass wherein the mesh is chromium dipped to insure both clean wire and firmer adhesion of the glass to the wire. To insure greater strength, the wire is embedded as closely to the center of the glass as possible.

patterns

On the next page will be found descriptions of Hammered, Ribbed, Luminex, Skytex, Mazex, and Industrex patterned glass. These patterns are produced either with or without wire. Blue Ridge Aklo Heat Absorbing Glass in Hammered pattern can also be furnished with or without wire. In addition, Aklo Polished Wire Glass is produced in conventional hexagonal shaped mesh only. For information on Aklo Wire Glass, see pages 20 and 21.

approved fire retardant

Blue Ridge Wire Glass is an approved fire retardant, bearing number R-2129 of Underwriters' Laboratories, Inc. The rules of the National Board of Fire Underwriters limit the size of wire glass which can be glazed in openings exposed to fire hazard. In no case shall the unsupported area of the glass measure more than 48 inches in either dimension or exceed 720 square inches (5 sq. ft.). Typical maximum sizes which satisfactorily meet that requirement are 15 x 48, 18 x 40, 20 x 36 and 24 x 30. It should also be noted that wire glass used for this purpose must be set in noninflammable materials.

conventional polished wire glass

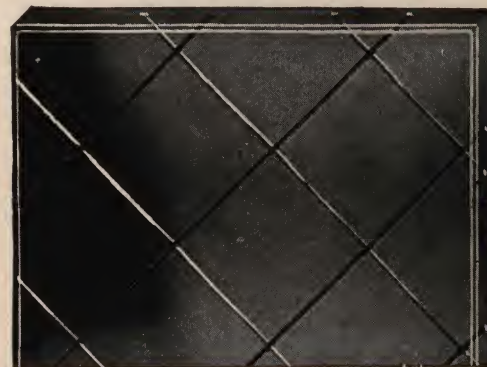
Used in all openings where clear vision and the security of non-scatterable, fire-retardant glass are desired. Note that wire is clean—no bubbles to mar the sharp outline or distort the vision.

Approved fire-retardant bearing number R-2129 of Underwriters' Laboratories, Inc.

nuweld polished wire glass

The wires in this glass are welded together at each intersection to form a pleasing diagonal pattern.

The wires are subject to some misalignment. Absolute symmetry of the wire pattern cannot be guaranteed. This product is advised for openings when vision plus security of non-scatterable, fire-retardant glass is desired.



nuweld polished wire
(wire shown actual size)



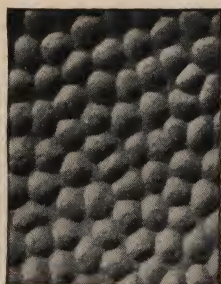
conventional polished wire glass
(wire mesh shown actual size)

specifications for Blue Ridge wire glass

Product	Uses	Light Diffusion and Obscurity	Pattern	Thickness	Plain Rolled, Fire Finish *Max. Width and Length	Surface		Approx. Weight Sq. Ft. Lbs. Glass Only
						Ground and Polished both surfaces	Frosted Max. Width and Length	
Hammered	Windows, skylights and partitions requiring non-scatterable, fire-retardant glass. Registered as Fire Retardant No. R-2129 by Underwriters' Laboratories, Inc.	Medium	Raised Adjacent Lenses	1/4"	48" x 144"		48" x 144"	3 1/2 lbs.
				3/8"	48" x 90"		48" x 90"	5 lbs.
				1/2"	48" x 90"		48" x 90"	6 1/2 lbs.
Ribbed		Medium (Directional Spread)	Fine Parallel Ribs	1/4"	48" x 144"		48" x 144"	3 1/2 lbs.
				3/8"	48" x 90"		48" x 90"	5 lbs.
				1/2"	48" x 90"		48" x 90"	6 1/2 lbs.
Luminex		Slight	Smooth fine texture	1/4"	48" x 144"		48" x 144"	3 1/2 lbs.
Skytex		Good (Directional)	Parallel Ribs	1/4"	48" x 144"		48" x 144"	3 1/2 lbs.
Industrex		Medium	Compact Lens-shaped	1/4"	48" x 144"		48" x 144"	3 1/2 lbs.
Mazex		Good—Highly Obscure	Floral swirl	1/4"	48" x 144"			3 1/2 lbs.
Hex. Mesh Polished Wire		None		1/4"	60" x 144"	60" x 144"		3 1/2 lbs.
Nuweld Polished Wire		None		1/4"	60" x 144"	60" x 144"		3 1/2 lbs.

*In some patterns widths are available up to 60 inches depending upon stocks on hand, but glass wider than 48 inches cannot be Frosted.

practical patterned glass



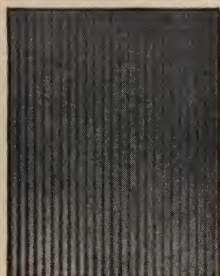
Hammered

(Pattern shown, actual size)

USES—Popular for industrial glazing, both interior and exterior.

DESCRIPTION—An all-over series of raised, adjacent lenses that diffuse light at a moderate angle in all directions.

Approximate Light Transmission—unwired 90.0%; wired 84.0%.



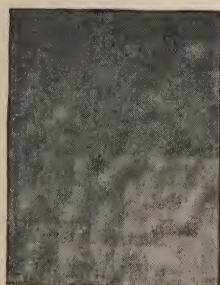
Ribbed

(Pattern shown, actual size)

USES—For factory glazing and skylights, and for fluorescent lighting fixtures.

DESCRIPTION—Approximately twenty-one fine parallel ribs per inch spread light along one axis only perpendicularly to ribs.

Approximate Light Transmission—unwired 84.4%; wired 78.4%.



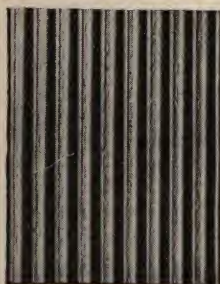
Luminex

(Pattern shown, actual size)

USES—Recommended for industrial plants or commercial glazing where maximum light is desired.

DESCRIPTION—An almost transparent, fine textured pattern with high light transmission and only slight diffusion. Can be *Satinol** finished to assure complete privacy for walls or office partitions.

Approximate Light Transmission—unwired 88.4%; wired 82.4%.



Skytex

(Pattern shown, actual size)

USES—Ideal for skylights; equally suitable for industrial glazing and for fluorescent fixtures.

DESCRIPTION—Obscure pattern of eight parallel ribs per inch which diffuses light on one axis only, perpendicular to ribs. Drains off condensation. Usually glazed with ribs vertical.

Approximate Light Transmission—unwired 78.9%; wired 72.9%.



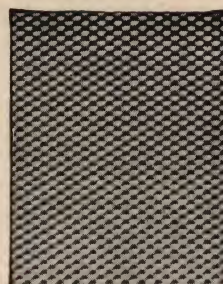
Velvex

(Pattern shown, actual size)

USES—Very popular for interior glazing—doors, partitions, transoms and shower stalls.

DESCRIPTION—A semi-transparent glass with a smooth texture—only slightly diffusing. Easy to clean, whether fire-polished or *Satinol** surface finish.

Approximate Light Transmission—89.0%. (Not made in wire glass.)



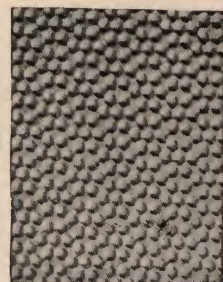
Industrex

(Pattern shown, actual size)

USES—Primarily for factory glazing. Also suitable for some types of commercial structures, fluorescent fixtures.

DESCRIPTION—Tiny lens-shaped figures give uniform diffusion of light over wide areas, provide medium degree of privacy, are easily cleaned. Not recommended for partitions in office buildings.

Approximate Light Transmission—unwired 88.2%; wired 82.2%.



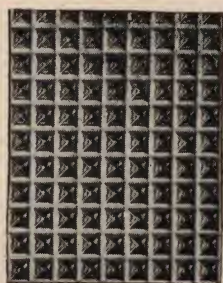
Diffusex

(Pattern shown, actual size)

USES—For interior or exterior. Excellent for walls, partitions, transoms in offices, factories.

DESCRIPTION—Small, slightly elevated lenses provide uniform illumination with moderate angle of diffusion. Lenses are spaced to avoid dirt-collecting pockets; easily cleaned.

Approximate Light Transmission—87.6%. (Not made in wire glass.)



Reglex

(Pattern shown, actual size)

USES—Especially effective in partitions and doors. Suitable for use in fluorescent fixtures.

DESCRIPTION—64 pyramidal-shaped indentations to the square inch diffuse light very well in a cross-shaped light pattern; highly obscure.

Approximate Light Transmission—52.3%. (Not made in wire glass.)



Muralex

(Pattern shown, actual size)

USES—Widely used for distinctive effects in partitions, doors, transoms, walls, ceiling lights.

DESCRIPTION—Finely engraved, fairly obscure all-over pattern that provides medium distribution of light at a moderate angle. Rich-looking, and very easy to clean.

Approximate Light Transmission—86.0%. (Not made in wire glass.)



Pebblex

(Pattern shown, actual size)

USES—Provides well-lighted privacy when used for office partitions and general interior glazing.

DESCRIPTION—A deeply imprinted, irregular pebble design that is highly obscure and unusually brilliant in appearance. Diffuses light at wide angles.

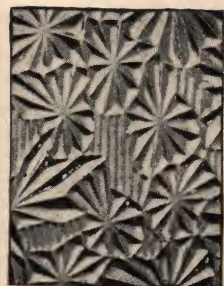
Approximate Light Transmission—79.7%. (Not made in wire glass.)

*SATINOL FINISH provides good light diffusion and excellent obscurity, assuring privacy plus light.

for varied industrial requirements



7a
2



Florex

(Pattern shown, actual size)

USES—Interior glazing only—partitions, transoms, doors and windows.

DESCRIPTION

—A graceful floral pattern. Its brilliance is largely due to the quality of the glass, since the imprinting is based on the principle

of avoiding sharp grooves as much as possible.

Approximate Light Transmission—86.2%.
(Not made in wire glass.)



Pointex

(Pattern shown, actual size)

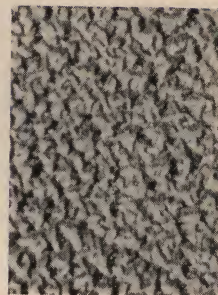
USES—Interior glazing in both plain and frosted finish. For sign work in frosted finish.

DESCRIPTION

—Semi-transparent, with one smooth surface and one covered with about 570 irregularly sized bosses

per square inch.

Approximate Light Transmission—92.5%.
(Not made in wire glass.)



Sterlex

(Pattern shown, actual size)

USES—Office partitions and general interior glazing where well-lighted privacy is needed; also for lighting fixtures.

DESCRIPTION

—Somewhat similar to Pebblex, but less deeply imprinted. Diffuses light at wide

angles, provides high degree of obscurity.
Approximate Light transmission—87.2%.
(Not made in wire glass.)

specifications for practical patterned glass

Product	Uses	Light Diffusion and Obscurity	Pattern	Thickness	Plain Rolled, Fire Finish *Max. Width and Length	Ground and Polished on Flat Surface Max. Width and Length	Frosted Max. Width and Length	Satinol Max. Width and Length	Approx. Weight Sq. Ft. Lbs. Glass Only
Hammered	Industrial Glazing	Medium	Raised Adjacent Lenses	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
				3/8"	48" x 90"		48" x 90"		5 lbs.
				1/2"	48" x 90"		48" x 90"		6 lbs.
Ribbed	Industrial Glazing	Medium (Directional Spread)	Fine Parallel Ribs	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
				3/8"	48" x 90"		48" x 90"		5 lbs.
				1/2"	48" x 90"		48" x 90"		6 lbs.
Luminex	Industrial Glazing for Maximum Daylight	Slight	Smooth fine texture	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
Pointex	General Glazing	Slight	Irregular Raised Bosses	1/8" (thin)	48" x 120"		48" x 120"		1 1/2 lbs.
Skytex	Industrial Glazing	Good (Directional Spread)	Parallel Ribs	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
Velvex	Interior Partitions, Doors, Transoms	Slight	Smooth mottled texture	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
Industrex	Factory Glazing	Medium	Compact, lens-shaped	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
Diffusex	Interiors for soft light diffusion	Medium	Elevated small lenses	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"	48" x 136"		48" x 136"	2 3/4 lbs.
Pebblex	Interior Glazing	Good	Irregular—pebbled effect	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"	48" x 136"		48" x 136"	2 3/4 lbs.
Reglex	Interior Glazing	Good	Regular Pyramidal Indentations	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"	48" x 136"		48" x 136"	2 3/4 lbs.
Muralex	Finer Interior Glazing	Good	Finely engraved—indeterminate	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"	48" x 136"		48" x 136"	2 3/4 lbs.
Florex	Interior Glazing	Good	Floral	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.
Sterlex	Office Partitions General Interior Glazing	Good	Pebbled Effect	1/8"	48" x 132"		48" x 132"	48" x 132"	1 3/4 lbs.
				3/8"	48" x 136"		48" x 136"	48" x 136"	2 3/4 lbs.

*In some patterns, widths are available up to 60 inches depending on stocks on hand, but glass wider than 48 inches cannot be Frosted.

BLUE RIDGE Aklo heat absorbing

description

Blue Ridge Aklo is a "low expansion" figured and wire glass of blue-green color, with extremely high resistance to passage of solar infrared rays and to sun glare when frosted. Provides free transmission of pleasing, eye-resting quality light—entirely suitable for precision and close work and other operations where eye fatigue is encountered.

patterns

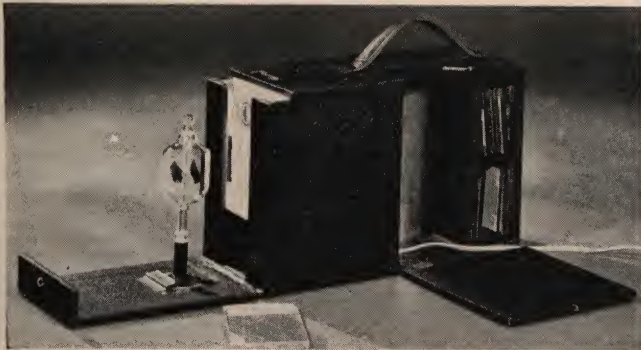
One pattern—Hammered, wired and unwired—is manufactured.



Abundant natural daylight, *without glare*, improves vision for close work in this East Hartford, Conn., machine shop.

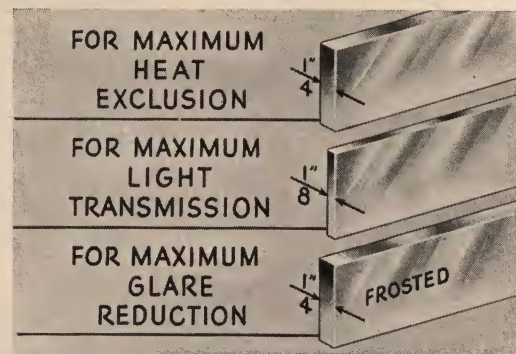
glare reduction

The primary function of Aklo Glass with fire-finished surface is to retard the entry of solar heat. To reduce sun glare through windows and skylights and, at the same time, improve illumination, Frosted Aklo should be used. In every instance where glare reduction is the primary purpose of installation, $\frac{1}{4}$ -inch thickness is recommended.



radiometer

The unusual heat absorption and glare reducing qualities of Blue Ridge Aklo Glass are visually demonstrated with the portable Radiometer Kit, shown above. Your glass distributor will gladly show you Aklo's superiority right in your own office.

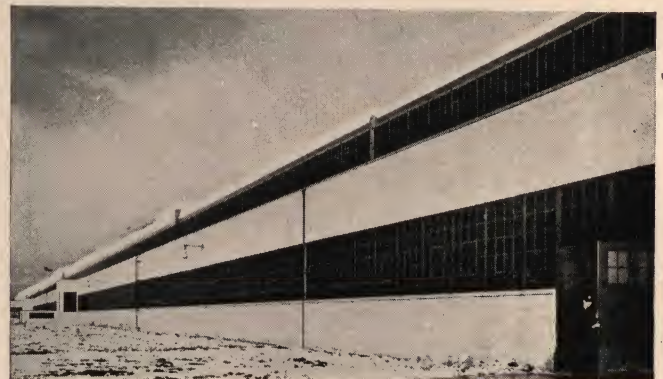


FOR SPECIFICATIONS

"To combine glare reduction and solar heat exclusion, specify Frosted Aklo or Hammered (Wired or Unwired), in $\frac{1}{4}$ -inch thickness. "All other skylights and window areas facing north or in permanent shade and designated on the drawings to receive obscure glass shall be glazed with non-heat-absorbing glass of the patterns, thicknesses and types indicated herein."

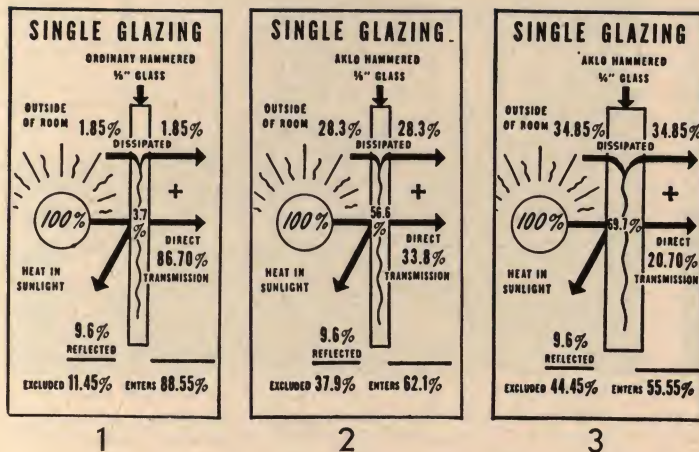
characteristics of Aklo Glass

The coefficient of expansion of Aklo Glass is approximately 20% less than ordinary glass—an important feature in sun heat control. To combine reduction of glare and exclusion of solar heat, specify "Frosted Aklo Hammered (Wired or Unwired), in $\frac{1}{4}$ -inch thickness" (if transparency is desired, specify $\frac{1}{4}$ -inch Aklo Polished Wire). Blue Ridge Aklo Glass complies with requirements of E9-Type H Glass for absorbing or intercepting ultraviolet and infrared rays, Federal Specifications DDG-451. Aklo Glass also conforms to those specifications outlined in paragraph No. 24 of May, 1939, Glass and Glazing Section of the Treasury Department.



Over 7 miles of Frosted Aklo in Melrose Park, Ill., plant of International Harvester cuts down solar heat, reduces sun glare.

How Aklo Stops Sun Heat Radiation



These three charts show how Aklo absorbs excessive solar heat while admitting ample light. They compare the flow of the sun's heat through (1) 1/8-inch ordinary hammered glass, (2) 1/8-inch Aklo Hammered Glass and (3) 1/4-inch Aklo Hammered Glass. Note how much more sun heat is dissipated by Aklo Glass than by ordinary glass of equal thickness.

Because Aklo Glass traps the solar heat in summer, it makes work areas far more comfortable than other types of industrial glass. When *Frosted*, Aklo greatly reduces glare—an aid to precision operations.

Comparative Qualities of Aklo and Ordinary Glass

Thickness and Kind of Glass	Heat			Efficiency Ratio of light transmission to heat passing directly through glass
	Total Heat of Sun Entering Room Through Glass			
	Reradiated by the glass	Transmitted directly through glass	Total heat entering through the glass	
HAMMERED PATTERN				
$\frac{1}{8}$ " Aklo Glass—Unwired	28.30%	33.80%	62.10%	1.87:1
$\frac{1}{8}$ " Ordinary (Lime) Glass—Unwired	1.85	86.70	88.55	1.03:1
$\frac{1}{8}$ " Frosted Aklo Glass—Unwired	34.00	23.00	57.00	1.87:1
$\frac{1}{4}$ " Aklo Glass—Unwired	34.85	20.70	55.55	2.58:1
$\frac{1}{4}$ " Ordinary (Lime) Glass—Unwired	3.70	83.00	86.70	1.07:1
$\frac{1}{4}$ " Aklo Glass—Wired	35.70	19.00	54.70	2.57:1
$\frac{1}{4}$ " Ordinary (Lime) Glass—Wired	5.60	79.20	84.80	1.07:1
$\frac{1}{4}$ " Frosted Aklo Glass	38.70	13.60	52.30	2.58:1
FOR COMPARISON ONLY				
$\frac{1}{8}$ " Aklo Glass—Polished	27.00	38.00	65.00	1.87:1
$\frac{1}{8}$ " Ordinary (Lime) Glass—Polished	1.85	88.30	90.15	1.03:1
$\frac{1}{4}$ " Aklo Glass—Polished	35.50	21.00	56.50	2.57:1
$\frac{1}{4}$ " Ordinary (Lime) Glass—Polished	3.75	84.50	88.25	1.07:1

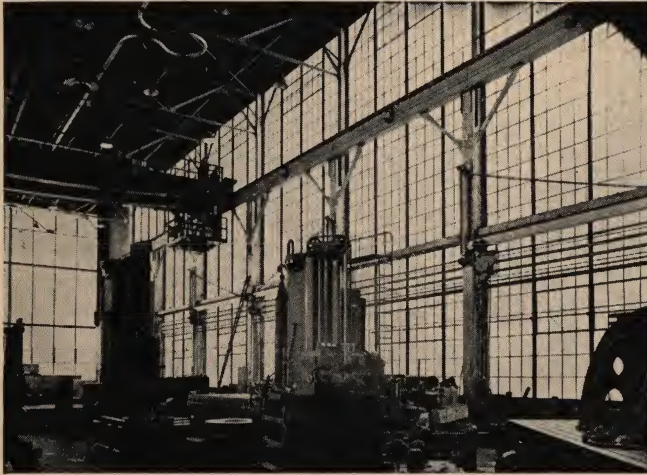
Specifications for Blue Ridge Aklo Heat Absorbing Glass

Product	Uses	Light Diffusion and Obscurity	Pattern	Thickness	Plain Rolled Fire Finished Max. Width and Length	Gr'nd and Polished	Frosted* Max. Width and Length	Approx. Weight Sq. Ft. Lbs.
FIGURED GLASS								
AKLO—Hammered	Substantially reduces sun's heat, admits daylight and improves illumination.	Medium	Raised Adjacent Lenses	1/8"	32" x 132"		32" x 132"	1 3/4 lbs.
				1/4"	32" x 136"		32" x 136"	3 lbs.
WIRE GLASS								
AKLO—Hammered	Same as for AKLO Heat Absorbing Figured Glass. However, being wired, each is a non - scatterable, fire - retardant glass.	Medium	Raised Adjacent Lenses	1/4"	24" x 144"		24" x 144"	3 lbs.
AKLO—Polished Wire (Hex. Mesh only)		None		1/4"	24" x 60"	X		3 lbs.

*Frosted AKLO provides excellent diffusion of light, high degree of obscurity and effective glare reduction.

*Frosted AKLO provides excellent diffusion of light, high degree of obscurity and effective glare reduction.

BLUE RIDGE Aklo glass (continued)



Frosted Aklo Hammered glass is used for glazing the windows of the Giddings & Lewis Machine Tool Company, Fond du Lac, Wisconsin. This reduces the sun's heat. Architect: Frank Stepnoski & Son, Fond du Lac.



Reduction of the sun's glare is important to such a textile mill as the Crawford Manufacturing Company of Richmond, Va. In addition, the heat absorbing qualities of Frosted Aklo make working conditions more pleasant.

representative list of Blue Ridge Aklo users

Fairfax Mills, Fairfax, Ala.
Goodyear Tire & Rubber Co., Gasden, Ala.
Dwight Mfg. Co., Alabama City, Ala.
Aluminum Co. of America, Phoenix, Ariz.
Southern Kraft Corp., Camden, Ark.
Pacific Mfg. Co., Santa Clara, Cal.
Hughes Aircraft Corp., San Diego, Cal.
Rohr Aircraft Corp., San Diego, Cal.
New Departure Mfg. Co., Bristol, Conn.
The Bullard Co., Bridgeport, Conn.
Vickers, Inc., Waterbury, Conn.
Pratt & Whitney Aircraft Corp., Hartford, Conn.
Pan-American Hangar, Miami, Fla.
Florida Linen Supply Co., Miami, Fla.
L & H Shirt Company, Cochran, Ga.
Dixie Cotton Mills, La Grange, Ga.
Columbus Mfg. Co., Columbus, Ga.
West Point Mfg. Co., West Point, Ga.
Container Corporation, Chicago, Ill.
Twin Disc Clutch Co., Rockford, Ill.
Buick Motors Corp., Norpaul, Ill.
Naval Ordnance Plant, Forest Park, Ill.
Republic Aviation Corp., Evansville, Ind.
McQuay Norris Mfg. Co., Connersville, Ind.
Aluminum Co. of America, Lafayette, Ind.
Tobin Packing Co., Fort Dodge, Iowa
Cessna Aircraft Corp., Wichita, Kan.
Boeing Aircraft Corp., Connell, Kan.
Menzel Co., Louisville, Ky.
Nash Kelvinator, New Orleans, La.
T. J. Murphy Fur Co., Lewiston, Me.
Revere Copper & Brass Co., Halethorpe, Md.

Glenn L. Martin Co., Middle River, Md.
Danzer Metal Works, Hagerstown, Md.
Ludlow Mfg. & Sales Co., Ludlow, Mass.
United States Rubber Co., Chicopee Falls, Mass.
Pacific Mills, Lawrence, Mass.
Leland Gifford Co., Worcester, Mass.
Ford Motor Bomber Plant, Willow Run, Mich.
Extruded Metals Corp., Grand Rapids, Mich.
Fisher Tank Corp., Grand Blanc, Mich.
Chevrolet Gear & Axle Corp., Hamtramck, Mich.
Long Hall Laundry, Kansas City, Mo.
American Can Co., St. Louis, Mo.
Curtiss-Wright Corp., Robertson, Mo.
Westcott Valve Co., St. Louis, Mo.
Martin Bomber Plant, Ft. Crook, Neb.
Waumbec Mills, Manchester, N. H.
Hyatt Roller Bearing Division, Clark Township, N. J.
Singer Mfg. Co., Finderne, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
General Cable Corp., Perth Amboy, N. J.
Rochester Products Div.—General Motors Corp., Rochester, N. Y.
New York Airbrake Co., Watertown, N. Y.
Worthington Pump Co., Buffalo, N. Y.
American Locomotive Co., Auburn, N. Y.
Republic Aviation Corp., Farmingdale, L. I., N. Y.
Concord Knitting Co., Concord, N. C.
Spofford Mills, Inc., Wilmington, N. C.
Parksdale Mills, Inc., Gastonia, N. C.

Arlington Mill, Gastonia, N. C.
Rosemary Mfg. Co., Roanoke Rapids, N. C.
Lake City Malleable, Inc., Ashtabula, Ohio
Canton Drop Forge, Canton, Ohio
Goodyear Rubber Co., Akron, Ohio
Curtiss-Wright Corp., Columbus, Ohio
Thompson Aircraft Products Co., Euclid, Ohio
Sylvania Electric Products Co., Emporium, Pa.
Landis Tool Co., Waynesboro, Pa.
National Biscuit Co., Philadelphia, Pa.
Curtiss-Wright Propeller Div., Beaver, Pa.
Naval Air Station, Davisville, R. I.
Bowling Green Spinning Co., Clover, S. C.
Ware Shoals Mfg. Co., Ware Shoals, S. C.
Brandon Corp., Greenville, S. C.
Equinox Mills, Anderson, S. C.
Rivermont Orchids, Inc., Signal Mountain, Tenn.
Tennessee Eastman Corp., Kingsport, Tenn.
Shelby Paper Box Co., Memphis, Tenn.
General Tire & Rubber Co., Waco, Tex.
Dow Chemical Co., Velasco, Tex.
Haggar Pants Co., Dallas, Tex.
Naval Ammunition Depot, Portsmouth, Va.
U. S. Marine Corps, Quantico, Va.
Sylvania Electric Products Co., Huntington, W. Va.
Corning Glass Works, Parkersburg, W. Va.
United States Rubber Co., Eau Claire, Wis.
Giddings & Lewis Machine Co., Fond du Lac, Wis.



BLUE RIDGE Securit patterned glass



7a
2

description

Securit is made by subjecting Blue Ridge Patterned glass, which has been annealed in the regular manner, to a special process of heat treatment and rapid cooling that creates a highly compressed zone at the outer surface. The tensile strength of Securit, as determined by its modulus of rupture, is over $3\frac{1}{2}$ times greater than in a piece of regular Blue Ridge glass of similar pattern and thickness. When the limit of its strength is reached, Securit disintegrates into small, rounded, relatively smooth particles.

In addition to its greater strength, Securit is extremely resistant to temperature variations which may affect a whole sheet, or only portions.

physical characteristics

Securit's physical characteristics determined by laboratory tests follow:

Modulus of Rupture—28,800 lbs. per sq. in. of cross section.

Hardness (Mohs' Scale)—6

Thermal Endurance—400° F. differential

Safe Working Temperature (maximum)—650° F.

Maximum sizes:

Square—30" x 30" Oblong—30" x 72"

advantages

Due to its special heat treatment, Securit Blue Ridge patterned glass possesses the following advantages:

Three to five times stronger than "non-Securitized" patterned glass.

Withstands impact shock far beyond the limits of ordinary rolled glass.

More resistant to thermal shock.

A safer glass since, when it does break, it disintegrates into small diced particles rather than large fragments with sharp jagged edges.

available forms

Patterned Glass $\frac{7}{32}$ " thickness—Hammered, Ribbed, Luminex, Skytex, Velvex, Industrex, Diffusex, Florex, Pebblex, Reglex, Muralex, Louvrex, Flutex, Stylex, Linex, Sterlex.

Patterned Glass $\frac{3}{8}$ " and $\frac{1}{2}$ " thickness—Hammered, Ribbed.

Patterned Aklo Glass $\frac{1}{4}$ " thickness—Hammered.

Patterned Glass $\frac{7}{32}$ " polished one side—Diffusex, Pebblex, Muralex, Reglex, Louvrex, Flutex, Stylex, Linex.

Note: Wire glass cannot be "Securitized".

uses

Office doors or partitions which are subjected to considerable slamming or bumping.

Lighting fixture diffusing glass, and lenses for lamps.

Ceiling sash or sub-skylights.

Tops for cutting tables or counters.

Push plates and kick plates.

Commercial and residential shelving.

Guards around areas subjected to intense heat.

Balustrades and stair railings.

Windows frequently broken by flying materials.

With its special physical qualities, numerous patterns and surface treatments, Securit is a versatile product. Practical uses are being found for it almost daily. The Blue Ridge Glass Corp., Kingsport, Tenn., welcomes inquiries from architects and opportunities to solve their problems.

Warning: Securit tempered glass is supplied by Blue Ridge Glass Corp., in the actual shapes and sizes required, but it cannot be subsequently cut or ground. Cutting or puncturing the surface or chipping the edges will cause immediate disintegration of the glass.



Securit office railing of Satinol Louvrex Glass is used in the Las Vegas, Nevada ticket office of the Union Pacific Railroad. This application of Securit Louvrex is both practical and handsome.



Blue Ridge Aklo Glass may also be Securitized. To overcome the salt fumes and intense heat in the Salt Curing Bath Department of the Dayton Forge & Heat Treating Co., Dayton, Ohio, windows are glazed with Securit Hammered Aklo.

L·O·F Hi-Test Safety glass

Libbey-Owens-Ford Hi-Test Safety Glass is made of two lights of polished plate or sheet glass bonded by tough transparent plastic, and represents the highest achievement in safety glass quality and performance. An important feature is that when safety glass is fractured, the particles of glass tend to adhere to the plastic, affording more protection against flying glass fragments.

For years, L-O-F Safety Glass has been a standard in the automotive and transportation industries.

Uses

Libbey-Owens-Ford Safety Glass is recommended for interior glazing areas where additional protection is desired.

Bullet Resisting Plate glass is a lamination of three or more lights of glass and transparent plastic. It is commonly used for glazing bank teller cages, cash booths and observation windows in pressure test chambers.

Note: Safety Glass made with *Tuf-flex* (page 11) has extra strength qualities.

Kinds of Glass	Number of Lights	Thickness of Safety Glass	Thickness Tolerance	Maximum Area per Lt.	Net Weight Lbs. per Sq. Ft.
Thin Safety Glass	2	$\frac{3}{8}$ "	$-\frac{1}{32}$ "	Up to 7 sq. ft.	1.92
S.S. Safety Glass	2	$\frac{7}{8}$ "	$\pm \frac{1}{32}$ "	Sizes up to 15 sq. ft. of area	2.94
Combination Safety Glass (S.S. & D.S.)	2	$\frac{11}{16}$ "	$\pm \frac{1}{32}$ "		2.95
D. S. Safety Glass	2	$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "		3.16
Safety Plate	2	$\frac{1}{4}$ "	$\pm \frac{1}{32}$ "	60 x 74	3.16



L·O·F DISTRICT OFFICES

Atlanta 3, Ga.	Lamar 0066	Memphis 3, Tenn.	37-7589
1001 Whitehead Building		540 Sterick Building	
Boston 16, Mass.	Hubbard 2-0100	Milwaukee 3, Wis.	Broadway 5704
1437 Statler Building		161 West Wisconsin Avenue	
Buffalo 3, N. Y.	Cleve. 0291	Minneapolis 2, Minn.	Main 8429
1126 Rand Building		506 Savings & Loan Building	
Chicago 3, Ill.	Central 6-2490	New York 22, N. Y.	Eld. 5-1025
120 So. LaSalle St.		570 Lexington Avenue	
Cincinnati 2, Ohio	Main 6174	Philadelphia 2, Pa.	Penny. 5-8666
912 Enquirer Building		1528 Walnut Street	
Cleveland 13, Ohio	Main 7180	Richmond 19, Va.	3-3034
1302 Terminal Tower Building		1122 Mutual Assurance Society Bldg.	
Dallas 1, Texas	Riverside 4026	St. Louis 1, Mo.	Central 9863
1402 Tower Petroleum Building		411 N. 7th Street	
Denver 2, Colo.	Tabor 8015	San Francisco 5, Cal.	Sutter 1-4360
414 Tramway Building		635 Rialto Building	
Detroit 2, Mich.	Mad. 0080	Seattle 1, Wash.	Seneca 2513
610 Fisher Building		210 Lloyd Building	
Indianapolis 4, Ind.	Franklin 1363	Toledo 3, Ohio	Main 5291
724 Circle Tower		12th Floor Nicholas Building	
Kansas City 6, Mo.	Victor 5360	Washington 6, D. C.	Sterling 4472
1004 Baltimore Street		806 Connecticut Avenue	
Los Angeles 13, Cal.	Michigan 0854		
905 Architects Building			

See the yellow pages of your telephone directory for your nearest Libbey-Owens-Ford glass distributor.

LIBBEY - OWENS - FORD GLASS COMPANY
TOLEDO 3, OHIO

a Great Name in **GLASS**

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